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ABSTRACT

A testing procedure used by J. W. Getzels and M. Csikszentmihalyi (1964) to gauge the relationship between problem finding and creativity in art students was employed in a study designed to determine if the same relationship existed in writers. Subjects were middle school students identified as either creative or noncreative by two separate measures and by their teachers. Eight creative and eight noncreative students identified in this manner were matched according to sex, grade, and IQ. Each student was asked to produce a piece of writing based on 15 objects placed on a table. They were told to use any or all of the objects and to arrange them as they wished. Two sets of evaluators judged the resulting writing on a variety of criteria, including the number of objects touched, the nature of the arrangement, the exploratory behavior exhibited by the subject, the amount of time spent writing, the total amount of time spent on the task, writing fluency, how the subject had changed the reality of the objects, and how their perspectives had changed. Results indicated that the creative students touched and manipulated more objects, chose more unusual objects, spent more time prewriting, and seemed to see more relationships between objects as measured by changes in the object reality variable than did noncreative students. These findings suggest that the attempt to understand a deeper structure in the relationship among objects and in how they occur has an effect on the originality of writing. (FL)

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THE RELATIONSHIP BETWEEN PROBLEM-FINDING AND ORIGINALITY, CRAFTSMANSHIP AND AESTHETIC VALUE OF THE WRITTEN PRODUCT IN TWO GROUPS OF STUDENT WRITERS

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THE RELATIONSHIP BETWEEN PROBLEM-FINDING AND ORIGINALITY, CRAFTSMANSHIP AND AESTHETIC VALUE OF THE WRITTEN PRODUCT IN TWO GROUPS OF STUDENT WRITERS

Much has been written about creativity; however, little is known about the origins of the creative act. What we do know has generally come from retrospective accounts of creative behavior by those recognized as having produced a creative product. These accounts have been, for the most part, attempts to recreate the setting from which the product came to be.

In studying creativity, investigators have generally dealt with the creative act, typically, the statistically infrequent solution to a problem.

Since an unanticipated result may be the product of a divergent response to a problem, such responses may require a modification of the problem, or a different approach that often involves a risk on the part of the problem solver. Thus, the critical issue in problem-solving may be problem-finding.

Although there is much literature on problem-solving, little can be found on problem-finding. With the exception of Getzels (1964, 1973) and Getzels and Csikszentmihalyi (1975) who have discussed the concept in detail, both theories and empirical evidence about problem-finding are sparse. However, several investigators have noted the importance of discovering the problem.

Einstein and Infield (1938) state:

> The formulation of a problem is often more important than its solution, which may be merely a matter of mathematical or experimental skill. To raise new questions, new possibilities, to regard old problems from a new angle, requires imagination and marks real advance in science. (p. 92)

The focus on problem-finding was continued by Wertheimer (1959), who affirmed that the productive question is more important and often a greater achievement than the solution.

Ernest Hilgard (1959) first differentiated between the types of problems that may be discovered, those that concern finding the "correct answer" and those that go beyond such "correct answer" problems.

Later Getzels (1964) distinguished three types of problems. The first is the "presented" or known problem. Wertheimer (1959) first describes this type of problem as being solved by recall or mechanical thinking. In this instance the problem is known or given and there are standard procedures for solving it.

The second type of problem is the "discovered" problem. The discovered problem is at the opposite extreme of the presented problem. The discovered problem has no known formulation, no consistent or recognized method of solution. The problem itself must be identified without the aid of a series of procedures that will ultimately lead to a solution.

Between the extremes of the presented problem and the discovered problem, numerous possibilities exist; Getzels (1964) suggests two points: (A) "There is a group of problems,

too often neglected by teachers and experimenters alike, in which the problem is not given but is discovered as "becomes known" and (B) there is a range of problems involving various degrees of what is known and unknown, requiring various degrees of innovation and creativeness for solution" (p. 242).

Although there have been a few more studies focusing on discovering the problem through questions e.g., (Suchman, 1966 and Ivany, 1969), the only study that has dealt with discovery-oriented behavior as the first step in the creative process was conducted by Getzels and Csikszentmihalyi (1964) with art students. The purpose of their research was to determine whether discovery-oriented behavior in a situation involving creative production was related to the assessed creativity of the product. This study is important to my research because it provided part of my rationale and design.

Getzels and Csikszentmihalyi studied 31 art students from one of the foremost art schools in the country. Each student was asked to produce a drawing from twenty-seven objects placed on a table. The students were told to take any or all the figures and arrange them as they wished on an empty table. The students were then to work on a drawing until they felt it was completed.

Discovery-oriented behavior was determined at both the problem formulation stage and the problem solution stage. The students were scored on the number of objects handled, the uniqueness of the objects chosen, and the selection and

arrangement of the objects. These observations in these areas produced a total problem-formulation score.

The problem solution was determined by (a) the openness of the problem structure ascertained by photographs taken at six-minute intervals, (b) discovery-oriented behavior while drawing, including behavior such as switching mediums, changing paper, pauses in drawing, or substituting objects, and (c) changes in problem structure and content or whether or not the students merely copied the objects or changed perspectives. The art students were interviewed following the completion of the drawing, and their answers were evaluated on a 1-5 scale indicating a low or high concern for discovery.

The results indicated a strong relationship between discovery-oriented behavior during the formulation of the problem and the originality of the drawing as rated by the judges. The investigators noted that the operationalization of the notion of discovery at the problem-formulation stage marked the first empirical evidence of the problem-finding notion.

The implications from this study could prove very important to research on written composition. If a relationship between problem-finding and the assessed originality of a written composition exists, then any research focusing on originality in composing must take into consideration the nature of this relationship.

There the purpose of my research was to determine whether such a relationship does exist.

Although Getzels and Csikszentmihalyi's research was done with artists, there is reason to assume a similar relationship between problem finding and assessed originality of the product in student writers. As with artists, writers must "discover" and formulate a problem to be solved in the composition, and this discovery-oriented behavior can be seen to have a relationship with a finished written product. The finished product of writers can be reliably assessed for originality (Getzels and Csikszentmihalyi, 1976) and this in turn can be compared with the discovery behavior of the writer.

Since researchers (Davis and Rimm, 1975, 77, 82) have suggested that "creative" students may be identified from a population of students with a high degree of reliability, this study will determine whether, in fact, these "creative" students do consistently exhibit "discovery oriented" behavior, and whether this behavior is positively related to the assessed originality of the product.

Therefore, the purpose of this research was to replicate the Getzels-Csikszentmihalyi study, to determine whether problem-finding behavior is observable in student writers, and to determine whether there is a relationship between problem-finding and the assessed originality of the written product.

Procedure

The students selected for this study were matched pairs of middle school students. The majority of students

are from a suburban-rural area and have middle to upper middle class backgrounds. The students attend a public school in Western Pennsylvania.

Students were identified for inclusion in the study based upon their responses to GIFFI - I, (Group Inventory for Finding Interests) (Davis-Rimm, 1982). GIFFI - I is a sixty-item inventory based on items and concepts from GIFT (Group Inventory for Finding Creative Talent) and from Davis (1975) How Do You Think Test. At present, reliability coefficients from GIFFI - I are in the .85 - .90 range. Validity coefficients using combined criteria of teacher ratings plus ratings of the writing samples have a median of .35. ($p < .01$). The validity coefficients range from .20 - .69. Generally, creativity scores from GIFFI - I agree with the outside criteria of teacher ratings and the ratings of writing samples; however, the low validity must be a consideration in the use of the GIFFI - I.

In addition to GIFFI - I, each student was identified as creative or noncreative by a teacher and an appropriate administrator using a seven-item checklist created by Davis and Rimm (1977).

Because each measure alone has questionable validity, the results of all three measures were combined to determine creative potential and noncreative potential. Scores from each of three measures were converted to a three-point scale (creative = 1, unsure = 2, and noncreative = 3) and were combined. Students with three (1) scores were considered to be

"creative; students with three (3) scores were considered to be "not creative."

Eight students identified through these measures as creative were matched with eight not creative students using sex, grade, and Intelligence Quotient (only those with an IQ above 125 were included in order to control for any intelligence-creativity interaction).

Each student wrote one composition. The writing took place in a laboratory situation with the investigator and one student per session. The sessions were conducted after school in an empty classroom. The student sat in a regular classroom desk. In front of the student were two adjacent tables. I sat to the right and behind the student with a clear view of both tables. This setting was used so that I could photograph and code what the student was doing and to facilitate the interview immediately following the completion of the assignment. I used a "semi-structured" interview technique because this technique allows reframing and reforming of the questions to obtain as much information as possible from the student.

Fifteen objects were placed on one table. The objects selected were to give the greatest possible variety of simple and complex, human and mechanical, abstract and concrete choices. Other objects were those familiar to students in a school situation. Several of the objects were similar to those used in the Getzels and Csikszentmihalyi study (1976), including a small manikin, a bunch of plastic grapes, a woman's velvet hat, a brass horn, an antique book, and a glass prism.

The second table was left empty and used by the students to arrange the objects. Each student came to the laboratory setting by himself or herself and was given the following instructions:

> Consider the objects on this table. Choose as many as you wish, rearrange them in any way you wish on the other table, handle them as much as you want. Your task is to produce any piece of writing as long as it is pleasing to you. You may take as long as you wish. You may use any or all of the objects in your writing.

The students were asked to write all notes and drafts on yellow paper which I supplied and to write their final draft on white paper which I also supplied.

Analysis of Data

The procedure for analyzing the data involved an assessment of the prewriting behavior (cf Figure 1, A_1, A_2, A_3, A_4), an assessment of the results of the interviews concerning the problem-finding behavior at both the problem-formulation and the problem-solution stages (cf Figure 2, B_1, B_2, B_3), and assessment of the written products. Problem-finding behavior at the problem-formulation stage involved those behaviors from the time the directions were given until writing on the white paper began. Problem-finding behavior at the problem-solution stage involved those behaviors from the time writing or the white paper began and the assignment was completed.

Although my study deals with writers, an effort was made to use the same means of assessment and variables as did the study with artists. Therefore, the assessments of the

prewriting, writing and evaluative behaviors replicate the work of Getzels and Csikszentmihalyi (1976).

Figure 1

Problem-Finding Behavior at the Problem-Formulation Stage

The five kinds of behavior at this stage include the number of objects touched, the uniqueness of the objects arranged, exploratory behavior during selection and arrangement, total time spent before writing, and total time spent on the writing task.

A_1 Number of objects manipulated. How many of the fifteen objects were handled by a student before writing, based on the record kept by the observer.

A_2 Uniqueness of the objects chosen. This was based on an analysis of all objects chosen and arranged by all the students. The most common object received a value based on the total number of objects used.

A_3 Exploratory behavior during selection and arrangement. A score of 1 was given if objects were just picked up and placed on the second table. A score of 2 if the student was observed holding the object for closer observation. A score of 3 was given for manipulation of the objects. A score of 5 was given when observation and manipulation occurred together.

A_4 Prewriting time was scored by taking the total time spent from the time instructions were given until the student began writing the composition.

A_5 Total time was recorded from the time instructions were given until the student indicated closure.

Figure 2

Problem-Finding Behavior at the Problem-Solution Stage

Results from the Getzels-Csikszentmihalyi study indicate a significant relationship ($p < .01$) between problem-finding at the problem-formulation stage and the assessed originality of the product as judged by artist-critics.

The three kinds of behavior assessed at this stage were changes in object reality, changes in the perspective of the objects used in the writing, and fluency which is a word count of the written product.

B_1 Changes in object reality. An A was given if the writer simply described all the objects on the second table. A B was given if there were changes in the perspective of the objects. A C was given if any of the objects were used in an obviously symbolic way. A D was given if the objects appeared in the paper in a manner other than that suggested by the objects on the table. For example, if the grapes were thrown in text rather than described. An E was given if the writer wrote fiction or poetry other than non-fiction.

B_2 Use of objects to create order or new perspective. This perspective variable was determined by observing how objects were used in the text as well as evaluating student responses to the question, "Why did you arrange the objects as you did?" The text evaluation and interview question determined if objects were arranged to create a new perspective or a merger of objects, and whether the arrangements complemented fiction or nonfiction.

B_3 Fluency. Fluency was the final word count of the finished product.

Product Analysis

Two panels of five judges each evaluated the written product. The first group of judges was chosen from middle school teachers of language arts. The second group of judges was also middle school teachers; however, they were chosen from disciplines other than language arts. Although this might seem to create the possibility of widely disparate views, Malgrady and Barcher (1979) found that people seem to have similar definitions of originality when asked to identify originality in writing without having a common definition. Getzels and Csikszentmihalyi (1976) also note that, although common definitions might make for a high degree of agreement, this might be counter productive considering the nebulous concepts and the multitude of divergent definitions.

Each judge, independently rated each paper on three aspects: originality or imaginativeness, craftsmanship or technical skill, and aesthetic value. The essays had been typed and the grammar corrected since both handwriting and grammar errors have been shown to influence raters (Huck & Bounds, 1972; Markham, 1976). Consequently, craftsmanship was defined as the technical skill of the work, not the use of conventions.

The judges rated the products on a 1 to 9 point scale.

By applying correlational methods to this distribution, estimates of relative agreement can be obtained within the judges and between the several types of ratings.

The second panel of judges composed of teachers from other disciplines received instructions the same as the first except the variables for the second group were briefly defined. They were given a framing definition of the product variables to see if the framing definitions differed from the definitions teachers of writing have without any discussion or definition. Originality was defined as an infrequent or divergent response, craftsmanship was defined as technical skill or organizational qualities or how well the essay is developed. Finally, aesthetic value was defined as the lasting quality of the essay or how memorable it was.

Results and Discussion

The data on problem-finding at the problem-formulation stage are presented in Table 1. The variables that measured problem-finding at the problem-formulation stage include 1) the total number of objects touched, 2) the uniqueness of the objects chosen and placed on the second table, 3) the number of objects the students were seen observing and manipulating, and 4) the time spent prewriting in relationship to the total time spent on the problem structure from the time the topic was given until closure.

The results indicate that the scores for the group of writers assessed as creative were consistently higher. Assessed creative writers touched objects a total of 19 more times than the assessed not creative group (means of 5.38 and

3 respectively). Although the groups were not significantly different, the alpha level approached significance.

A larger difference is noted in the Uniqueness score. Each object that students could choose to arrange was given a score based on how often it was used. An object used by many students received a low score while objects rarely used received high scores. Assessed creative students had a significantly higher mean, 16.25, than the assessed noncreative group, 3.0. As a group, the students assessed as noncreative chose fewer objects to place on the second table, when they chose any objects at all (four from the assessed noncreative group did not choose any objects at all as opposed to one from the assessed creative group), and these objects tended to be the most commonly chosen objects.

There was no significant difference between scores of two groups in objects chosen and placed i.e., manipulation and examination of the objects regardless of whether they were placed on the second table. However, the assessed creative group mean score was higher, 3.5, than the assessed noncreative group, 2.0. The lower mean indicates that fewer objects were handled, examined and manipulated.

The difference between the groups in the amount of time spent prewriting was also not significant. This is the time recorded from when the directions were given to when the student was observed writing the final draft. However, the creative group's mean was again higher. They averaged 2 minutes and 21 seconds in prewriting, whereas the assessed

noncreative group averaged 1 minute and 47 seconds, a difference of 34 seconds.

The difference in the entire time spent by the students on the problem structure seems to be in the same proportion to the prewriting averages and was also not significant. The assessed creative group averaged 57 minutes and 51 seconds on the problem structure while the assessed noncreative group averaged 49 minutes and 30 seconds of writing time on the problem.

Thus, the assessed creative group touched more objects than the other group, arranged more objects on the second table and arranged more unique objects, were seen observing and manipulating more objects, and spent more time prewriting and more time on the problem structure.

My second question concerned the relationship between problem-finding at the problem-solution stage and the assessed originality, craftsmanship and the aesthetic value of the written product.

The variables that measured problem-finding at the problem-solution stage were: 1) changes in object reality, 2) changes in the perspective of the objects used in the writing, and 3) fluency, a word count of the written products.

Changes in object reality refers to how the object appears in the text. Objects may be A) described with no changes in perspective, B) described with changes in perspective of the objects, C) used symbolically, D) appearing in a manner other than suggested by the table arrangement, and E) arranged

TABLE 1

PROBLEM-FORMULATION STAGE

Variable	Assessed Creative Group N-8 Mean	SD	Assessed Non-Creative Group N=8 Mean	SD	Diff	t Value
Number of Objects Touched	5.38	3.07	3.0	3.67	- 2.38	-2.04
Uniqueness of Objects	16.25	10.37	3.0	4.24	-13.25	-3.46*
Objects Chosen & Placed	3.5	2.13	2.0	2.5	- 1.50	-1.47
Prewriting Time	2.16	1.49	1.75	1.40	- .4	-1.28
Total Time	57.66	24.10	49.30	28.40	- 8.36	-0.81

*Significance beyond .05 level

to complement fiction, poetry or some other nonfiction form. This variable, object reality, determines the way students perceived the objects to be used in the text. It was scored by analyzing the written product.

In scoring this variable, A may appear alone or with any other category, B must occur with C since any change in perspective will render the object symbolic. B may occur with any other category since each object is its own entity. C may occur without B. An object may be used as a symbol, for example, as "old" or "new" without a change in physical perspective. C may occur with any other category. D must occur with B or C since any object used in a manner other than suggested by the arrangement must by symbolic or changed in perspective, but D may also occur with any other category. E may occur alone or with any other category. E used alone indicates no objects were used.

The results (Table 2) indicate that the assessed creative group shows a much higher but not significant co-occurrence of the changes in object reality. No one in the creative group merely described the objects without changing object reality. However, three students from the noncreative group showed no co-occurrence in object reality. Objects were simply described.

The second variable at the problem-solution stage is the use of objects to create order or new perspective. This perspective variable was determined by observing how the objects were used in text as well as evaluating student responses to the question, "Why did you arrange the objects as you did?"

TABLE 2

PROBLEM-SOLUTION STAGE

Variable	Assessed Creative Group N=8 Mean	SD	Assessed Non-Creative Group N=8 Mean	SD	Diff	t Value
Change in Object Reality	11.0	4.24	5.63	5.44	-5.38	-1.97
Change in Perspective T Story	1.38	.74	1.88	1.25	.500	.94
Fluency	349.25	155.53	233.50	125.97	-115.75	-1.97

This variable was evaluated by separating essays and responses into two categories: plus or minus story, which means the student either wrote fiction or nonfiction. (There were no other categories.)

The arrangement of objects was evaluated if students arranged to give order to the presentation of objects in the text, or if objects were arranged to create a new perspective or a merger of objects. This differs from the previous variable which focused on the uses of objects in the text.

Students who wrote fiction and arranged the objects to give order to the presentation in the text received a W score. Students who wrote fiction and arranged the objects to create a new perspective received an X score. Students who wrote nonfiction and arranged the objects to give order to the arrangement in the text received a Y score, and students who wrote nonfiction and arranged the objects to give a new perspective received a Z score. A Ø score indicated the student wrote fiction but used no objects.

The results (Table 2) indicate that all but one in the creative group wrote fiction, one changed the arrangement of the objects to create a new perspective. The noncreative group had only three students who wrote fiction and four who wrote nonfiction and arranged the objects to be described in order. Of these seven, all arranged the objects to be described. The final student wrote fiction but used no objects.

The final variable, fluency, was simply the total number of words produced. The difference (Table 2) between

the two groups was not significant, but the creative group wrote an average of 116 more words than the noncreative group. The average number of words written by the assessed creative group was 349.25 words, the assessed noncreative group wrote 333.5 words.

The results of the ratings by the judges are presented in Table 3. The results from the first group of judges, the English teachers, indicate that the creative group was considered to be significantly better on originality and aesthetic value but not different on craftsmanship. In fact the means for craftsmanship were identical.

The results of the ratings by the second group of judges (the non-English teachers) was similar on originality and aesthetic value, but they also rated the creative group significantly higher on craftsmanship.

Data on the relationship between judges are presented in Tables 4, 5 and 6. Both groups of judges agreed on overall originality ratings. The correlation between the two groups of judges on all originality scores was .92. The Pearson Product Moment correlation between groups of judges on all craftsmanship scores was .82 and on aesthetic value, .76. Thus, although the two groups of judges disagreed on craftsmanship, their ratings were still highly correlated.

Agreement between judges was also high within the creative and noncreative groups. For the creative group, the correlation between judges on originality was .71, for craftsmanship, .92, and for aesthetic value, .80. For the noncreative

group, the correlation between judges for originality was .94, for craftsmanship, .82 and for aesthetic value, .51.

Thus, a clear pattern of scores for each variable at both problem-solution stage and the problem-formulation stage indicates a difference between the two groups. The creative group scores were higher, although not always significantly higher, than the noncreative group scores in a direction one would predict from the correlative research of Getzels and Csikszentmihalyi (1976). Furthermore, there was a clear pattern of accord on originality scores and aesthetic value scores in a direction one would predict.

The relationship between problem-finding at both the problem-formulation and problem-solution stages and the assessed originality and aesthetic value of the written product was strongly supported by the data. The results indicate that the way a student approaches a writing problem, i.e. the problem-formulation stage, does affect the originality of the written product. Merely touching objects, manipulating objects, choosing unique objects, or spending more time before writing does not cause a student to have original products. However, creative student writers who touched more objects, manipulated more objects, chose more unique objects and spent more time at this prewriting stage of the problem seem to be seeing more relationships between objects as measured by the change in object reality variable than noncreative student writers. I interpret this to indicate that an increased attempt to understand a deeper structure in the relationship among objects and how they co-occur has an effect on the originality of the written product.

TABLE 3

PRODUCT EVALUATION

Variable	Assessed Creative Group N=8 Mean	SD	Assessed Non-Creative Group N=8 Mean	SD	Diff	t Value
Originality Group I Judges (Expert)	35.50	5.58	25.13	9.09	-10.38	-5.14**
Craftsmanship Group I Judges (Expert)	30.50	6.35	30.63	4.17	0.13	.08
Aesthetic Value Group I Judges (Expert)	29.38	4.90	24.75	3.88	- 4.63	-3.78**
Originality Group II Judges (Non Expert)	31.63	4.98	23.00	8.80	- 8.63	-3.89**
Craftsmanship Group II Judges (Non Expert)	27.50	6.82	22.88	6.15	- 4.63	-2.67*
Aesthetic Value Group II Judges (Non Expert)	26.25	6.80	20.00	5.35	- 6.25	-3.80**

*Significant beyond the .05 level
**Significant beyond the .01 level

TABLE 4

RELATIONSHIP BETWEEN JUDGES OVERALL SCORES
(PEARSON PRODUCT MOMENT CORRELATION)

Originality	.92**
Craftsmanship	.82**
Aesthetic Value	.76*

TABLE 5

RELATIONSHIP BETWEEN GROUPS OF JUDGES
ASSESSED CREATIVE GROUP

	Group II Judges		
Group I Judges	Originality	Craftsmanship	Aesthetic Value
Originality	.71*	.59	.74*
Craftsmanship		.92**	.92**
Aesthetic Value			.80*

TABLE 6

RELATIONSHIP BETWEEN GROUPS OF JUDGES
ON ASSESSED NONCREATIVE GROUP

	Group II Judges		
Group I Judges	Originality	Craftsmanship	Aesthetic Value
Originality	.94**	.87**	.85*
Craftsmanship		.82*	.78*
Aesthetic Value			.51

*Significant beyond the .05 level
**Significant beyond the .01 level

These results concur with the correlative research of Getzels and Csikszentmihalyi (1976) who found a similar relationship with artists at the problem-formulation stage. The uniqueness and originality scores of the creative writers were significantly higher than these scores in the noncreative group. Getzels and Csikszentmihalyi also found a significant, positive relationship between their unusualness scores and the originality rating of the finished drawing (Pearson r of .42). The artists who had the most original products were consistently higher than their counterparts on the problem-formulation variables. Thus, the artists and writers who had the most original products were both consistently higher on the process variables at both the problem-formulation and problem-solution stages.

Two conclusions are suggested by my data and the research of Getzels and Csikszentmihalyi. First, writers and artists who exhibit a concern for problem-finding at the problem-formulation stage and problem-solution stage will have the most originally rated products. Second, during composing, before writing or drawing, student writers and artists share similarities in problem-finding cognitive strategies even though the medium differs. This is more striking because the student writers were all middle school age students, while the artists were at a post high school level.

An important aspect of the Getzels-Csikszentmihalyi study was establishing problem-finding as a behavior that exists prior to problem-solving in discovered rather than presented problem situations. Since this distinction was made

in both studies, it is assumed that both problem structures in each study belong within the discovered problem rubric, thus problem-finding behavior in artists and writers, regardless of age, is highly related to the originality of the finished product whether it be written or drawn. Both creative writers and artists appear to see more relationships between objects at a deeper structural level where these relationships can be explored prior to creating a product.

This does not mean that writing and drawing are the same or that they employ the same cognitive strategies. However there does seem to be a point at which artists and writers engage in similar behaviors as they approach a problem that first must be discovered.

Although both groups of judges in my study agreed highly (.92) on what they thought were the most original products, it is interesting to note where the judges did not agree. Language arts teachers rated both groups, creative and noncreative, equal in craftsmanship, while the teachers from other disciplines rated the most original products the best crafted products. Indeed, a significant relationship was found between the originality scores and the craftsmanship scores in the non-English teachers ratings. Thus it appears that language arts teachers were able to differentiate between originality and craftsmanship without any definitions for either term, but the other judges concept of craftsmanship seemed to be influenced by originality even though they received brief definitions

for each product variable. This difference may be the result of the training of language arts teachers in assessing student writing, i.e., organization, good topic sentences, properly drawn conclusions, etc. Since all papers had been typed and the surface level errors corrected, the difference appears to be in each group's approach to content and quality.

However, the fact that the English teachers mean craftsmanship rating for both groups is higher than the ratings given by the non-English teacher may indicate that the absence of error and penmanship, affects English teachers' perceptions of a relationship between craftsmanship and originality.

There is a notable difference on craftsmanship between the writing judges and the art judges in the Getzels and Csikszentmihalyi (1976) study. There were four groups of art judges: artists, art teachers, business students, and mathematics students. The artists and art teachers found more of a relationship between originality and craftsmanship than the mathematics and business students. This difference may be accounted for by the way content and quality are assessed in art products. Thus, originality may play a more important part in the content and quality of art products while originality may not be as important to teachers of writing in judging quality and content. Of course, had Getzels and Csikszentmihalyi been able to "correct the errors" in the art products, the results might have been more in line with my results.

Implications

Since my research has shown that there is a relationship between problem-finding and product originality in student writers, and since students assessed as creative consistently scored higher than noncreatives on the variables measuring problem-finding, then the next question is whether this behavior is consistent outside the confines of this study. Studies are needed to determine whether student writers who had been preassessed as creative produce original writing in a variety of contexts and situations in the various modes of discourse and on other topics. If creative writers can do this, then problem-finding must be considered an important component of the writing process, and if it is not controlled in our experiments, it may lead to misinterpreted results. Although my study does not directly indicate that creative students are consistently more creative in their writing, the results warrant further investigation, especially by manipulating writing tasks, contexts, audience and mode of discourse, for the results are sufficient to indicate that writing studies involving a process approach to originality must take into account problem-finding behavior.

If problem-finding as a behavior prior to problem-solving does exist across writing situations, then we also need to determine whether noncreative writers should be taught to write products which will be more apt to be judged highly original. A companion piece to the present study might focus

on encouraging noncreative students to engage, prior to writing, in such activities as manipulating objects and creating trial arrangements with objects or by encouraging them to write fiction and to use the objects in a variety of ways. Perhaps noncreative students can be shown how to perceive relationships between objects which would lead to more original products. This implies more than just the typical "prewriting" strategies such as brainstorming. Rather, it involves showing students how to find deeper relationships and, this may lead to discovering problems rather than just discover answers.

Finally, if we can assume that the objects used in my study, readily identified by every student, are common to everyone's life experiences, then we might ask how a person's life experiences, the relationships between these experiences, and a person's "schema" for integrating these experiences affect or effect problem-finding as part of the process that leads to creative production. If we may assume that touching objects, manipulating concrete objects, or otherwise inspecting objects is a manifestation of the way writers and artists analyze feelings and synthesize life experience awareness, then touching and manipulating (the observables) may provide us a window for studying the unobservable ways students analyze and syntheisze.

My research has shown that the theory and method from art can be adapted to writing, and that this adaptation leads to new insights. Perhaps other adaptations can be made from areas such as mathematics and science. We may find that

regardless of mediums or symbols used, students engage in similar behavior at the outset of a discovered problem situation. Since the ability to find a deeper structure in the relationships of whatever is being examined seems to be one component of creativity, then more studies should indeed focus on the process of creative production, not on the finished product.

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